



**THE SOUND OF JULIE** was heard around MSC July 2 as filmstar Julie Andrews toured the Center. Here, FCSD Simulation Branch chief Stan Faber checks her out in the Lunar Module Simulator in Building 5. She was accompanied by her husband, film director Blake Edwards.

## Three Firms to Study Space Shuttle Concepts

NASA has awarded 11-month Phase A feasibility contracts for study of several alternate space

### Laser Reflector Added to Apollo 14

A Laser Ranging Retro-Reflector (LRRR), similar to the one placed on the lunar surface during the first U.S. lunar landing, has been added to the scientific experiment package scheduled to fly aboard Apollo 14.

The LRRR, designed to make laser distance measurements from the Earth to the Moon with an accuracy of six inches is scheduled to be placed in the Fra Mauro region of the Moon by Alan B. Shepard, Jr. and Edgar D. Mitchell. Apollo 14 is scheduled for launch no earlier than Dec. 3, 1970.

The proposed landing site for Apollo 14 is 3 degrees 36 minutes south and 17 degrees 24 minutes west, approximately 800 miles west of the position of the Apollo 11 LRRR in the Sea of Tranquility.

Lunar range measurements from the second LRRR will provide valuable new information to scientists on the dynamics of the Earth-Moon system. The two LRRR will serve as a "benchmark" to which precise range measurements can be made by timing the round-trip of a short pulse of laser light reflected from it. Eventual plans call for the placement of a third LRRR on the surface of the Moon.

The LRRR consists of an array of 100 special reflectors of fused silica mounted on a square frame 18 inches on a side and weighs about 45 pounds (Earth weight).

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shuttle concepts to Gruman Aerospace Corp., Bethpage, N.Y., Lockheed Aircraft Corp., Los Angeles, Calif. and Chrysler Corp., New Orleans, La. The Boeing Company, Seattle, Wash. will be a major subcontractor to Gruman. The contracts were effective July 6.

MSC will manage the Grumman/Boeing contracts which involve study of three shuttle concepts:

1. A stage-and-a-half shuttle consisting of a single reusable manned spacecraft with an on-board propulsion system and dropable tanks to provide supplementary propellants.

2. A reusable orbiter with expendable booster. This envisions a second stage orbiting shuttle launched on an existing expend-

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## Earth Resource Aircraft Scans Peru Quake Area

The government of Peru has accepted NASA's offer to send one of its remote sensing aircraft to help assess damage resulting from the recent severe Peruvian earthquake.

The aircraft, stationed at MSC departed July 11. It stopped in Mexico City to pick up two representatives of the Mexican Space Commission's earth resources team and arrived in Lima July 12.

The aircraft, A Lockheed Electra equipped to acquire the black and white, color, and color infrared photography and thermal infrared imagery will be used to obtain data over the area in northern Peru which suffered the most

NASA announced Wednesday that it will reduce civil service employment by about 900 per-

### Gilruth Receives ASME Medal

MSC Director Robert R. Gilruth will receive the American Society of Mechanical Engineers Medal at the ASME Winter Annual Meeting in New York November 29-December 3.

The ASME Medal will go to Gilruth "for his distinguished service in aeronautics and space research and for his outstanding engineering leadership, by which he inspired and directed this nation's manned space flights and successful landings on the moon."

sonnel by October 1, 1970. This reduction includes a decrease of 200 planned in NASA's FY 1971 Authorization Act signed by the President on July 2, 1970.

The principal reductions will be at NASA Headquarters in Washington, D. C., and Manned Space Flight installations. The reductions at each NASA location affected will be approximately:

Headquarters	200
Manned Spacecraft Center	150
Marshall Space Flight Center	190
Kennedy Space Center	85
Ames Research Center	54
Langley Research Center	82
Lewis Research Center	114
NASA Pasadena Office	25
	900

## Balloon-Borne Payload Recovered near Odessa

A 3,000 lb scientific package part of a NASA sponsored study of cosmic ray in the upper atmosphere, was successfully recovered near Odessa, Texas after a 600-mile balloon flight from East Texas.

The scientific payload is part of the High Altitude Particle Physics Experiment (HAPPE), a project co-sponsored by NASA and the University of California Berkeley. The instrument package was lifted to an altitude of approximately 104,000 feet from the National Center for Atmospheric Research Center at Pales-

tine, Texas at 9 p.m. July 9.

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## Anniversary Program Marks Eagle's Landing

"Tranquility Base here. The Eagle has landed . . ."

A year has passed since those calm words from Neil Armstrong told the waiting world that man has landed on another celestial body. The Eagle touched down a year ago Monday.

The final reductions in force at each location will be determined by the requirements for retaining a balanced work force for accomplishing NASA missions at the lower employment levels. NASA is acting to have the reduction-in-force completed by October 1, 1970, in order to minimize the number of employees who must be discharged.

Together with the reduction of approximately 600 earlier this month in connection with the Electronics Research Center at Cambridge, Mass., the reductions announced today will bring total civil service reductions in the last three years to above 5,200 and give NASA a staff of 29,850, the lowest since 1963. MSC's current onboard strength is 4288.

MSC management believes that the MSC reduction will be closer to 200 positions. A precise figure is not yet known. The 150 figure represents a minimum reduction.

MSC will observe the first anniversary of the Apollo 11 lunar landing by holding an extensive public open-house program tomorrow, Sunday and Monday. Saturday hours will be from 9 am to 5 pm, Sunday 1 pm to 5 pm and Monday 10 am to 4 pm.

Facilities at MSC open to visitors will include the auditorium and exhibit hall, the Mission Simulation and Training Facility, the Life Systems Laboratory, Central Data Office, Anechoic Chamber, Centrifuge, Mission Control Center, Space Environment Simulation Laboratory, Lunar Receiving Laboratory and cafeteria.

Equipment and space hardware flown on Apollo 11 will be on display in the auditorium lobby and the firm "Returns From Space" will be shown at intervals in the auditorium. The Apollo 11 command module Columbia is on a tour of all 50 state capitals and will not be available for the open house.

The Lunar Science Institute, located east of MSC on NASA Road 1, will also be open to the public Sunday and Monday from 3 to 5 pm.

severe earthquake damage.

Data acquired during the mission, which supplements that data already obtained by the Peruvian government, will be processed at MSC and furnished as rapidly as possible to Peruvian government authorities for analysis.

The duration of the mission will be from a week to a month depending upon cloud cover conditions. It is expected that the data obtained, in addition to helping the Peruvian government assess damage and plan reconstruction, will also contribute to the future application of the science of remote sensing to natural disasters.

Approximately 30 different flights are scheduled during the next several weeks, along the Pacific coast of Peru as well as the Santa valley which experienced the heaviest damage. The NP3A Lockheed aircraft is being flown by members of the MSC Aircraft Operations Project Office (APO). APO is part of the Earth Orbital Missions Office of the Science and Applications Directorate.

The aircraft will stage out from Lima Calleo International Airport, Lima and overfly the several target sites at altitudes of 28,000 feet and 5,000 feet.

Frank Newman of the Aircraft Project Office is Mission Manager.



THEY PUT THEIR IDEAS where their mouths were, and on June 30 received their suggestion award checks. Top money went to Forrest L. Sealey, Jr. and Jose Cambiaso who each got \$205 for suggesting a method of eliminating image damage during processing of color film sound tracks. Others taking home suggestions cash were: George L. Bosworth, \$100; Robert L. Oppelt \$65 and \$35; Leona F. Germany \$50; Roy W. Collins \$40; Gerald C. Shows \$35; David N. Holman \$30; Norman H. Gabbard \$30; Joyce K. Patterson, David C. Schultz, Calvin F. Herman, Allivan F. Bray, Daniel G. Hanning, Harrison F. Shoemaker, John H. Boynton, Joe W. Dodson, Roger N. Messier, Leroy E. Mul-laley, Luther G. Kaigler, Cheryl F. DeMunbrun and Evelyn L. Huvar, all \$25 each; Lubert J. Leger, Ivan K. Spiker and Horace E. Whitacre, all \$20 each.

## Langley Seeks Ways to Spot Atmospheric Carbon Monoxide

As a part of the national attack on the problem of atmosphere pollution, the NASA Langley Research Center has begun development of a space-borne sensor for carbon monoxide.

A Langley contract to prepare a flight experiment based on an advanced type of sensor for measuring carbon monoxide concentrations has been awarded to the General Electric Company's Space Division, King of Prussia, Pa. The 30-month effort is valued at \$1,077,00.

It is an outgrowth of an invitation issued by NASA's Office of Space Science and Applications late in 1968 announcing opportunities for experiments for Earth-oriented applications satellites. General Electric responded to that announcement with a proposal for the carbon monoxide sensor.

Scientists estimate that the Earth's atmosphere contains about 500 million tons of carbon monoxide. Each year, automobile exhausts, industrial activities and other sources generate some 200 million tons of carbon monoxide.

However, measurements over a period of years indicate that the total concentration of carbon monoxide in the atmosphere is apparently not increasing despite the huge quantities added every year, a fact which implies that there must be some natural mechanism for removing most of the gas as it is generated.

The Langley-sponsored experiment is designed to make global measurements of carbon monoxide over a period of a year in an effort to map those portions of the Earth's atmosphere with high, low and average concentrations of the poisonous gas. In that way, scientists hope to identify the so-called removal sinks in which the gas is changed to another compound. Unless the removal mechanisms can be defined, there is no way to predict whether the carbon monoxide concentration will increase in the future or by how much.

General Electric's proposed experiment is based on an instru-

ment known as a correlation interferometer being developed by Barringer Research, Ltd., of Toronto, Canada. The interferometer is an optical device capable of detecting very small amounts of gas constituents.

During the 30-month development program, which is divided into four phases, G.E. and Barringer as a G.E. sub-contractor, will define the experiment in detail; develop and demonstrate a laboratory version of the instrument; complete development of an engineering model of the sensor; and finally, if the preceding steps are successful, undertake a series of flight demonstration tests using a balloon or an aircraft.

Selection of the particular satellite on which the fully developed experiment will be flown will not be made until later in the program.

## For Speedier Mail

Because of recent organizational and moving of offices the central mailroom is receiving a large amount of mail which does not have the proper mail code. This causes delay in delivery of this type mail as it must be looked up in the locator system. For prompt delivery, employees are urged to use the proper mail code in routing inter-Center mail,

## RFP's Sought For Shuttle Ground Facilities

Aerospace and architectural engineering firms have been invited to submit proposals for assisting NASA in planning ground facilities for a space shuttle system.

One firm will be selected as a contractor to support a newly established NASA Shuttle Facilities Group for 12 months in developing an over-all facilities plan, with options, for a space shuttle system that could be in operation by the late 1970's.

The shuttles, now in preliminary design, are foreseen as reusable airplane-like vehicles that will transport people and cargo between Earth and low Earth orbit at greatly reduced costs compared with present expendable rockets.

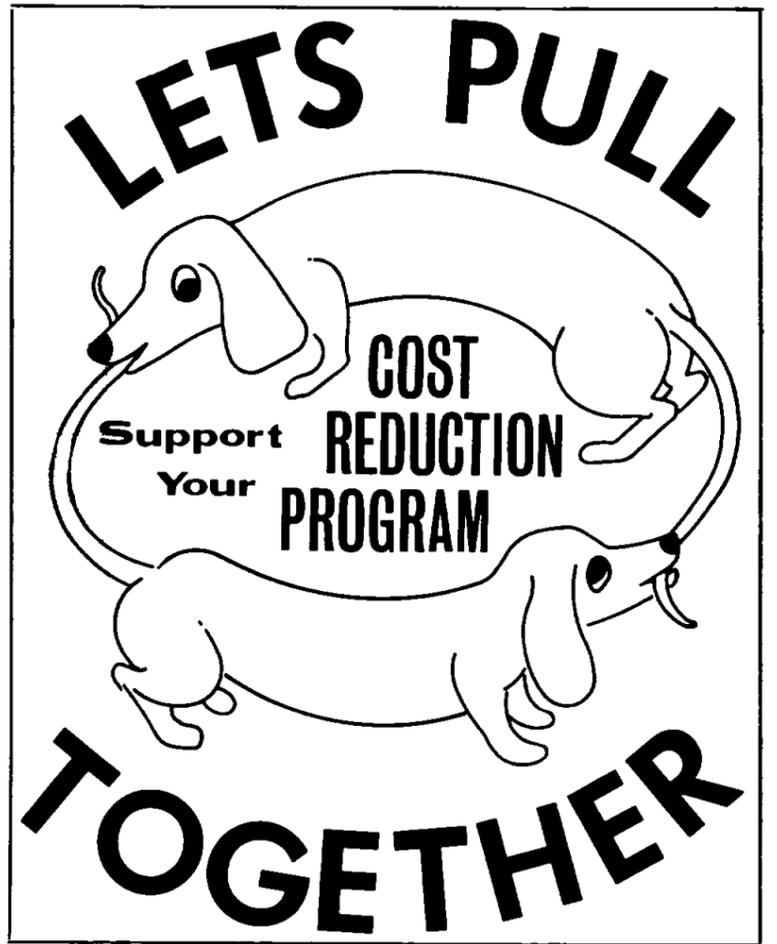
The 12-man Shuttle Facilities Group is headed by R. H. Curtin, NASA Director of Facilities, and includes representatives of the Office of Facilities, Office of Manned Space Flight, Office of Advanced Research and Technology, NASA's three manned flight Centers, and the U. S. Air Force.

In drawing up its plan the group will look at existing facilities, including those at Kennedy Space Center, Fla.

and that outside correspondents are notified of their current mail code.



A CENTURY OF SERVICE was chalked up by these retirees from the MSC Financial Management Division shown during a party at the Ellington AFB Officers Club. Left to right are Margaret R. Harrison, 26 years; FMD chief Russell C. Connelly; Ima D. Mitchell, 21 years; Frances M. Morphew, 25 years, and Oscar D. Keller, Jr., 29 years.



## Texas Tech to Develop More Comfortable Biosenor

MSC has awarded a \$20,000 contract to Texas Tech University to develop a new type electrode which may be used to monitor heart function of crewman on Skylab missions.

The first Skylab flight—a 28 day, earth orbital mission is scheduled for late 1972. One of the objectives of Skylab missions will be to evaluate the effects of long duration space flights on the crew's physical condition.

Electrocardiograms electrodes now available must be attached to the pilot's body with a wet electrolyte paste. A dry, insulated electrode would be more easily removed and reattached in flight. It would also be more comfortable.

The primary problem in the fabrication of an insulated electrode is the deposition of an extremely thin, tough dielectric

which can withstand normal handling and abrasion.

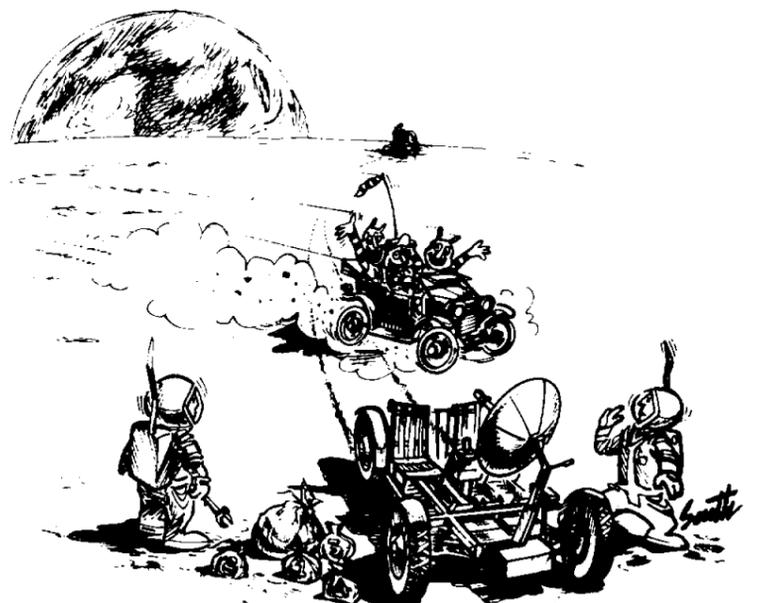
Work on the new electrode will be conducted at Texas Tech University in Lubbock under a one-year cost-reimbursement-type contract. Texas Tech is to deliver 25 completed ECG electrodes to MSC for evaluation and possible use on Skylab and other future programs.

## Another Degree?

MSC employees who received graduate degrees during FY-70 are asked to call the Employee Development Office at 7311 and let them know the type degree, major and school attended. The office also asks that a copy of the diploma be sent to D. Burns BP3 for inclusion in the employee's personnel folder.

## THE ASTRONUTS

courtesy of TRW's gordon a. south



## Shuttle Heatshielding Studied

Metal shielding that would protect a reusable space vehicle from intense heat as it re-enters the Earth's atmosphere is being studied by materials scientists at the NASA Lewis Research Center, Cleveland.

The heat shield is for the proposed space shuttle planned for ferrying men and cargo between Earth and Earth orbit. Still on the drawing boards, the shuttle is envisioned as a two-stage workhorse system consisting of a booster and an orbiter. Each stage will return to Earth to land and be reused. Materials studies at Lewis focus on shielding for the orbiter which must withstand temperatures of up to 3,000 degrees Fahrenheit during re-entry. At that point the orbiter is traveling more than 17,000 miles an hour.

During re-entry the bottom surfaces and leading edges of the orbiter all are exposed to extreme heat. The temperatures predicted range from about 1,800 to 3,000 degrees F. A major portion of the vehicle -- between 5,000 to 10,000 square feet, depending on the final design -- will experience temperatures ranging from 1,800 to 2,000 degrees F., according to Charles Blankenship, head of the materials processing section here. "The best candidate material for a heat shield to protect this large area," says Blankenship, "is a dispersion strengthened nickel-chromium alloy."

Blankenship explains nickel-chromium is an oxidation resistant alloy that can be further strengthened for very high temperature application by dispersing throughout the alloy submicron size particles of thoria, a stable oxide. Research on dispersion-strengthened alloys has been con-

ducted at Lewis for the past ten years under the direction of John Weeton, chief of the composite materials branch. Previously dispersion strengthened nickel-chromium has had potential application only for jet engine components such as stator vanes. The space shuttle heat shield represents another even more difficult application.

The heat shield design requires that the alloy sheets be made extremely thin on the order of 0.010 to 0.020-inch with very close tolerances to keep the weight down. Necessarily, the shield would be structurally supported to withstand aerodynamic loads and be backed by a ceramic - type insulation to further protect the vehicle from heat. Fansteel Inc., of Baltimore, Md. under a \$1,350,000 contract with Lewis is to develop a standardized process for manufacturing large quantities of the alloy sheet to the difficult specifications. The company also will deliver 1,500 pounds of the processed material which will be supplied to other NASA centers and NASA contractors for use in space shuttle technology studies.

Other areas of Lewis materials work for the shuttle include research on coatings for refractory metal alloys that would shield the leading edges of the orbiter at temperatures above 2,200 degrees F. and could be used as a backup material in the 1,800 to 2,200 degree F. regime.



**A MENU LIKE THEY'LL NEVER SEE IN THEIR KITCHENS** was described to about 100 MSC secretaries July 8 by Dr. Malcolm Smith, chief of the Food and Nutrition Spaceflight Biomedical Specialty Team. Smith described packaging techniques as well as types of food used in space flight in a presentation to the MSC Secretarial Seminar conducted by the Employee Development Branch. The Seminar met in the Bldg 30 auditorium.

## Space Shuttle Concept

*Continued From Page 1*

able booster or on a new minimum cost first stage liquid or solid propellant booster.

3. A reusable first stage using existing J-2S engine technology and solid propellant auxiliary boosters with a reusable second stage orbital shuttle also powered by J-2S engines. The J-2S engine is an advanced version of the J-2 hydrogen-oxygen engines successfully used on the second and third stages of the Saturn V launch vehicle.

Estimated value of the Grumman fixed-price contract is \$4 million.

The Lockheed study, to be managed by NASA's Marshall Space Flight Center, Huntsville, Ala., will define an alternate stage-and-a-half shuttle system including both high and low cross range designs.

Estimated value of the Lockheed fixed-price contract is \$1 million. In a related Phase A (feasibility) effort, the Chrysler

Corp. will study another concept — a reusable vehicle that can place a payload into Earth orbit with a single stage. Estimated value of the fixed-price contract is \$750,000. The contract will be managed by the Marshall Space Flight Center.

The Grumman/Boeing and Lockheed studies will rigorously re-examine the feasibility of shuttle concepts that might be competitive — technically and economically — with the two stage fully reusable system. The results of these studies, together with those already underway, will assure that nothing is overlooked and that the shuttle concept finally selected for development will indeed provide the most economical space transportation system.

## Golfers Play Fifth Tourney

MSC Golf Association members found the Bear Creek course to their liking July 11 as they played their fifth tournament of the year. Max Engert had the low score of the day, a 74.

Sam Glorioso won the championship flight with a net score of 66; Bob Reaves was second with 67; Bob Epperson was third with 69; and Engert and Bill Whipkey tied for fourth with 70's.

Tom Cassias was the first flight winner with a net 65; T. F. Gibson was second with 66; and Mike Hendrix and Jerry Shinkle tied for third with 68's.

Kenneth Land won the second flight with a net 63. Bartus Batson, A. L. Dupont, and Louis Leopold tied for second with 67's.

The next tournament will be at the Glenbrook Park course August 8.

## Roundup Swap-Shop

(Deadline for Swap-Shop classified ad is Thursday of the week preceding Roundup publication date. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 15 words, including name, office code and home telephone number. Send ads in writing to Roundup Editor, AP3.)

### MISCELLANEOUS

15-hp Michigan Marine Senior Twin engine, Paragon gear, strtr/gen kaput, 290 lbs. 932-4472  
Regulation size pool table, Sears, good condition, \$45. C. R. Hammer, 488-4237, after 5 pm  
Three cushion sofa, rust color, like new \$100; child's electric sewing machine, \$10; Niblet clarinet, \$75. Adams 534-3243.

Dog house, for large dog or small husband, 4x8, floor plan, 591-3912.  
Dishwasher, front loader, built-in, copper-tone, Tappan, used 4 weeks, Plauche, 474-2660.

Hotpoint electric dryer, good condition, \$45. Brooks 479-5132.

Professionally made 8 track one hour stereo tapes, your records or mine, McGarrigle, or 644-8401 after 7 pm.

Windjammer Carribean cruise for two from Martinique aboard "Flying Cloud." Cost \$610. Sell for \$500. C. M. Jones ext. 3361.

5-pc Formica dinette set, \$25. Stokes. 479-4963

Lady Kenmore 15-lb 10-cycle washer, used 3 mos. 488-2184.

7x10-ft. steel storage building, \$65. Record rack, \$5. Phone stand, \$4. Cooper, 944-2680.

10-gal aquarium, lid w/filcent lite, wrt iron stand, pump, \$20. Merrifield, 591-2437.

Blonde human hair fall, cost \$65—sell \$30. Vittone, 488-2206.

Heathkit MP-1 xistor pwr supply, Multi-Elmac AF-67 xmtr, Gonset G-66 rcvr, manuals for all; two 3-in Airdux coils, \$95. Trebes, 649-2897.

Fourth interest in 65 Beech Musketeer, dual nav-com, ADF, other xtras, Bouvier, 946-5282.  
32-in 6-hp riding lawnmower, used two yrs, \$150. Baillie, 482-7491.

Early American 9-dwr triple dresser w/mirror, two drwrs cedar lined. \$55. 877-1843.

Gibson RB-185 5-string longneck banjo, arch top, hardshell case, strap. Grayson, 488-0616.

Golf membership in Clear Lake Country Club, \$175. Nugent, 488-3136.

Ithaca 12-gauge double barrel, modern barrels, \$125 or trade for other guns. Buck, 483-5156.

Full membership in Sunmeadow Country Club, \$100 plus \$25 July dues. Taylor, 482-1023

Yazoo 24-in self-propelled lawnmower, \$135. Heath, 482-3052.

Brunette Dutch-boy cut fall, worn once, cost \$85—sell \$30. 482-2962.

Mark X 22-cal target rifle, \$45. Bass guitar w/amp \$60. Lizza, 932-4663.

65 Honda 160 CB, good condition, helmet, \$215. Peltitt, 483-2189.

Clarinet w/case, good for beginner, \$35. Garza, 472-5243 after 5.

### BOATS & SPORTING EQUIPMENT

14' Lyman boat & tilt trailer, first \$275 for both. Matelski, 944-1350.

8' miniature "hydro-Place" racing boat, yellow with black trim, recently built, needs fiberglassing, \$50. Reina, 488-1326.

69 Larson, 17' All American, 55 hp Johnson; top, side and back cover; Galv. trailer. All like new. 471-4032.

Tent, 10x18 with room divider, used five times, \$115. Original cost \$225. Mistrot, 534-5480.

14' boat, 45 hp Mercury, electric start, trailer. Good for fishing & skiing, \$500. Siegfried, 487-0781.

17-ft 1970 travel trailer, 4 months old, fully equipped, sleeps 6 or 7. Crider, 631-0591.

16-ft fiberglass inbd skiboat, 165-hp, trailer, Osburn, 877-3012.

23-ft Helton convertible, twin 75-hp Johnson electrics, trailer and accessories, Hensley, 483-4291.

### REAL ESTATE

4-2-2 Glen Cove, central A/H, carpets, drapes, built-ins, 16 mos, 6 1/4%, \$158/mo, \$2,300 equity, Adroin, 877-4960.

Need space? 5-BR, 2 baths, den, large yard, Sun Valley addition, Houston. Near schools, churches, Alameda-Mall. K. Bissonnet, 528-2477.

Friendswood 3-2-1, central air/heat, drapes, patio landscaped, near elem school, assume 6%, \$119/mo. 482-1563.

League City 4-2-2, 6%, builtins, fireplace, living, dining, den, utility, intercom, air, wet-bar/patio. Gelven, 932-6017.

12x60-ft 1965 Trojan mobile home, 2-br, air, \$3300 or \$1000 equity and 22 payments of \$118.

Long, 932-5758.

Pasadena 3-2-2 brick, central air/heat, built-ins, fence, huge trees, patio, walk to schools, 5 1/4% VA, \$5300 equity. Schutt, 944-8138.

4-2-2 El Lago, 6%, assume, carpets, drapes, fireplace, large secluded backyard. 877-2165.

### AUTOS

'67 Mustang, 289 V8, 3 speed floor shift, factory air, exclnt condition, Boykin, 528-3673.

'65 Safari land rover, new tires, exclnt condition, \$1,300. T. Brisbin, 729-2276.

56 VW 2-dr sedan, good body, mechanical and tires, \$200. Ferguson, 482-7910.

66 F-85, automatic and air; 68 Toyota automatic; 69 Austin automatic. Falbo, 483-5371.

69 Opel GT, red, good cond, \$2695. Crawford, 932-5449 after 5.

63 MGB Blue Baby, runs fine for wolves or wolverines, \$895. Rummell, 591-2708.

66 Merc, pwr and air, must sell. Bowling, 932-6609 after 6.

67 Pontiac Firebird 2-dr hrdtp, 2000 miles on 69 6-cyl engine, air, vinyl top, radio, buckets, needs tires, \$1600. Hendrickson, 488-2477.

### PETS

Free, five kittens, six weeks old, Walter Scout, League City 932-4804.

Pointer puppies. Ready July 20, Sire AKC, 10 champions last five generations. Dam perfectly marked, good on birds. Ward, 946-5182.

Puppies, mother AKC wirehaired Terrier, 5-wks old, wormed, tails clipped, \$6. 488-4134.

4-yr old gentle bay quarter horse, great for children, \$175. Rochelle, 483-5156.

4 female German Shepherd pups, registered, wormed, distemper shots, excellent temperament, show quality. Engel, 482-7830.

### WANTED

Formal wedding gown, size 7-9, not more than year old. 877-4519.

Rent or buy flute. Humbert, 944-8753.

Rider to accompany driver to LA (Vandenberg AFB), leave August 29. Gooding, 591-2093 after 5.

Ride from Kirby/Westheimer to MSC Bldg 45 8-4:30, share expenses. Madison, 483-3751.

Baby highchair. Anderson, 649-7516.

## Arrange Tours Thru Ext 4321

Employees with visiting relatives wanting a tour of the Center should call the Special Events Office at 4321 to make reservations for the twice-daily guided tours. The guided tours are at 9:30 a.m. and 1:30 p.m. Reservations should be made as far in advance as possible, especially during the summer months when school is out and families take vacations.

Hours for the do-it-yourself open-house tours are 10 a.m. to 4 p.m. weekdays and 1 p.m. to 5 p.m. Sundays. Facilities open for the open-house program are Bldg. 12 Central Data Office, Bldg. 29 Flight Acceleration Facility (centrifuge), Bldg. 5 Mission Simulation and Training, Bldg. 3 Cafeteria with the MSC Exchange Council's souvenir shop and the Bldg. 1 auditorium and exhibit hall. Motion pictures are shown at regular intervals in the auditorium.

## A Year Ago? It Seems Like Yesterday

A year ago Monday at 9:56 p.m. CDT, Neil Armstrong placed his left foot on the surface of the Moon and uttered the now-famous words for all the world to hear, "That's one small step for man, one giant leap for mankind."

Eighteen minutes later Edwin "Buzz" Aldrin joined Armstrong on the lunar surface and together

they read the plaque which remains on the Moon. Inscribed are these words: "Here Men From the Planet Earth First Set Foot Upon the Moon, July 1969, A.D. We Came In Peace For All Mankind."

July 1969, A.D., Anno Domini for the year of Our Lord -- how will that year be recorded by the historians? Does that time, so precisely marked by that first footprint on the Moon, end one age for man and herald the beginning of a new one?

Historians have devised ways to reckon time and bracket eras and periods into neat packages. Religious historians use the Latin, Anno Mundi, for the Age of the World and the years in our time are Anno Domini years.

There have been other categories like Prehistoric Age, the Age of Exploration and more recently the Machine Age, the Atomic Age and the Space Age.

But whatever the age or the period or the method of reckoning time, throughout the history of man he has always had his eye on the Moon wondering about its mysteries and dreaming on day to explore it. Now, just a year ago, man has done this, and this great dream and aspirations long held by man has been realized.

So now there are all those aeons before the lunar landing by man, and that short one year since this epochal event, the time when man left Earth and physically extended his influence to another planet.

We simply take note of the first anniversary of man's landing on the Moon. But some historians exercising their prerogatives to mark that precise date -- July 20, 1969 A.D. -- more auspiciously for the history books of tomorrow, may well devise another way of reckoning time after this event. Thus, it is not unlikely that our scholars may record time from the manned lunar landing

as a 1 A. L., for 1 Anno Adventus ad Lunam, which roughly translated from our even rougher Latin means the first post lunar year. Latin scholars may argue with our Latin, but historians will not quarrel with the fact that on July 20, 1969 at 9:56 p.m. Central Daylight Saving Time, an era ended for man and a new one began.

### BALLOON PAYLOAD

(Continued from page 1)

The HAPPE instrument was launched by a 10.6 million cubic foot balloon and it then drifted westward within 50 miles of Odessa where it was commanded to descend at 7:30 a.m. July 11. Shortly after launch the telemetry system malfunctioned; however NASA officials report this may not have damaged the effectiveness of the scientific recording instruments aboard the payload.

The scientific package is now at the University in Berkeley under going analysis.

### LASER REFLECTOR

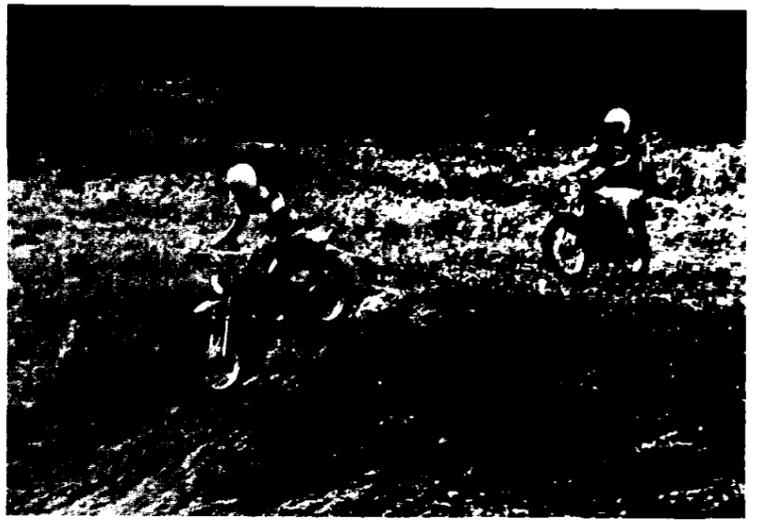
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A very short laser pulse of light is transmitted from an Earth-based telescope to the Moon-based reflector.

The distance can be calculated from the measured round-trip travel time (approximately 2.5 seconds) and the speed of light (186,000 mps).

Primary scientific objectives of the LRRR include the study of gravitation and relativity (secular variation in the gravitational constant), the physics of Earth (fluctuation in rotation rate, motion of the poli, large-scale crustal motions) and the physics of the Moon (physical librations, center-of-mass motion size and shape).

Dr. James Faller, Wesleyan University, Middletown, Connecticut, is the principal investigator for the LRRR.



THINGS HAVE CHANGED a lot over the last 10 years, including motor bike riders. They used to ride just in gangs. Now, they are apt to ride together for good, clean fun. Pictured here are Harry Clancy (left) on his trail bike and Royce McKinney (right) on his enduro.

## MTF to Study Gulf Coast Area Earth Survey Data

As Saturn V first and second stage firing tests are phased out at the NASA Mississippi Test Facility, the agency will begin using MTF for study and analysis of Earth resources data on the Gulf Coast area. The program will utilize MTF employees and facilities. MTF is located north of Bay St. Louis, Miss.

NASA Administrator Dr. Thomas O. Paine said the program would use data from Earth Resources Technology Satellites A and B, Apollo manned flights and from aircraft operations. Paine said that the MTF laboratory and the nearby Slidell, La. computer center will support the study effort. He further said the decision to begin the program followed earlier invitations to other government agencies to locate earth resources efforts at MTF and avoid the costs of new facilities.

The initial sources of data to be studied include manned space flight experiments like the Earth resources experiment flown on Apollo 9, the MSC-based Earth Resources Aircraft Program, the ERTS A and B flights and ground-truth surveys of the area. Although the number of NASA and contractor employees has not been firmed up, it is expected that about 75 people will be involved.

## Trailbikes Help Riders 'Get Away From It All'

By Vicki Jones

The vroom of motor bikes has different meanings for different people. To a group of guys who work for the Landing and Recovery Division, it means trail bikes. For the uninitiated, trail bikes are motor bikes that are used off-the-road. They have high clearances for riding in rough terrain. Other classes of bikes are track bikes, used for competition; enduro bikes; and largest, street bikes.

Harry Clancy is a trail bike owner. You remember Harry.

He's the fella who got \$800 for a Suggestion Award. He used his award money to buy a trail bike. When asked what prompted him to get one, he replied that he'd had a street bike in Africa (while in the Peace Corps in Nigeria) for expediency and diversion, but he's not sure what reawakened his interest. It was probably from reading about off-the-road bikes that would let him "get away from it all."

Another employee, John Hamlin, tells about the riding a group of them did in New Mexico after hours while doing some testing at White Sands recently. They rode through the woods of Lincoln National Forest . . . on gravel roads, along old railroad tracks. The tracks were left from log-cutting days, and all the ties had rotted. But there were enough rails for a bike to follow.

Closer to home, there are several places people can ride. In this area they can use the motor-cross near Clover Field. It isn't circular, but winds through woods, over gulleys, down jumps. Or, they can trailer bikes to the state park at Huntsville. A suitable alternate is any big pile of dirt that's packed solid.

When riding, it's best to ride in pairs of bikes. Not only does this provide camaraderie, but if one bike has a failure, the rider isn't left stranded miles from civilization. One rider said everybody he knows bought buddy seats and buddy feet to convince their wives of the purchase, and then the wives are too scared to go.

Harry Clancy tells of the time his bike stalled a third of the way up a hill. It was a panicky feeling to think he might slide down backwards, and the incline was such that he couldn't get his bike started and gain momentum.

Fred Toole, Road Captain for the Space Center Cycles, says this EAA club is interested in having members with smaller bikes. Competition events, such as barrel racing and skill riding could be set up, perhaps in the large fields of Galveston County Park.



A NEW PROGRAM for graduate engineering students from Lamar College of Technology in Beaumont has been worked out in conjunction with the MSC Engineering and Development directorate. Under the program, a candidate for an engineering graduate degree will work for eight months at MSC after finishing his academic requirements at Lamar Tech. The student will receive graduate credits toward a master of engineering degree for the on-the-job phase. A candidate may complete his graduate work in two semesters. The first graduate engineering candidate, John B. Kinard, third from left, will be assigned to the Guidance and Control Division. Others attending an initial meeting for starting the new program are, left to right, G&C Division chief Robert Chilton, Director of Engineering and Development Maxime A. Faget, Kinard, Lamar Tech Electrical Engineering Department head Dr. Wendell Bean and Spacecraft Design Office Systems Support Branch chief Allen Louviere.

## Apollo 11 Sample Reported Missing

A miniscule fragment of Apollo 11 lunar material — weighing about one-fiftieth of an ounce — was still missing at Roundup press time from a NASA Goddard Space Flight Center laboratory.

The sample was reported missing by GSFC scientific Dr. Nicholas M. Short after he inventoried his lunar samples the last week in June and found that one of his fifteen fragments was AWOL. The sample was one of several being circulated among a group of scientists studying shock waves in lunar material. At the time of the inventory, Short was preparing to return his samples to the Lunar Receiving Laboratory sample curator at MSC.

The quarter-inch long aspirin-size sample was part of a one-pound fine-grained grey rock (sample 10020) returned from Tranquility Base a year ago by the Apollo 11 crew. The rock was split up into smaller fragments for distribution to investigators.

NASA and investigative agencies are attempting to track down the missing fragment.

The Goddard fragment is the second Apollo 11 sample reported missing by a scientist. A University of California at Los Angeles scientist late in January reported one of his samples missing during a public display. The sample was later recovered from a mailbox following an anonymous telephone call.